

Glossary

Abney level	A type of clinometer.
Accuracy	The nearness of a measured value to a true value, or a specified analytical truth.
Algae	Nonvascular plants mostly living in water.
Alluvial	Having to do with soil deposited by a river or other running water.
Ambient Monitoring	Sampling and evaluation of receiving waters not necessarily associated with episodic perturbations.
Allochthonous	Organic matter that was produced outside the system (e.g., wood, leaves, berries, insects etc.).
Anadromous	Describes fish that live most of life in oceans or lakes and migrate to streams to spawn.
Antidegradation Statement	Statement that protects existing uses, prevents degradation of high quality waterbodies unless certain determinations are made, and which protects the quality of outstanding national resource waters.
Assemblage	An association of interacting populations of organisms in a given waterbody, for example, fish assemblage or a benthic macroinvertebrate assemblage.
Aquatic Life Use	A beneficial use designation in which the waterbody provides suitable habitat for survival and reproduction of desirable fish, shellfish, and other aquatic organisms; classifications specified in state water quality standards relating to the level of protection afforded to the resident biological community by the state agency.
Attribute	Measurable part or process of a biological system.
Autecology	The ecology of individual organisms and populations, including physiological ecology, animal behaviour, and population dynamics. Usually only one or two species are studied.
Autochthonous	Organic matter produced within the system (e.g., algae, macrophytes).
Beneficial Uses	Desirable uses that water quality should support. Examples are drinking water supply, primary contact recreation (such as swimming), and aquatic life support.
Benthic Macroinvertebrates or Benthos	Animals without backbones, living in or on the sediments, of a size large enough to be seen by the unaided eye and which can be retained by a U.S. Standard No. 30 sieve (28 meshes per inch, 0.595 mm openings). Also referred to as benthos, infauna, or macrobenthos.
Best Management Practice	An engineered structure or management activity, or combination of these that eliminates or reduces an adverse environmental effect of a pollutant.
Best attainable conditions (Reference)	See <i>Reference Condition</i> .
Biological Assessment or Bioassessment	An evaluation of the biological condition of a waterbody using surveys of the structure and function of a community of resident biota.

Biological Criteria or Biocriteria	<p>(Scientific meaning) are quantified values representing the biological condition of a waterbody as measured by structure and function of the aquatic communities typically at reference condition.</p> <p>(Regulatory meaning) are narrative descriptions or numerical values of the structure and function of aquatic communities in a waterbody necessary to protect the designated aquatic life use, implemented in, or through water quality standards.</p>
Biological Diversity or Biodiversity	Refers to the variety and variability among living organisms and the ecological complexes in which they occur. Diversity can be defined as the number of different items and their relative frequencies. For biological diversity, these items are organized at many levels, ranging from complete ecosystems to the biochemical structures that are the molecular basis of heredity. Thus, the term encompasses different ecosystems, species, and genes.
Biological Indicator or Bioindicator	An organism, species, assemblage, or community characteristic of a particular habitat, or indicative of a particular set of environmental conditions.
Biological index	A metric or set of metrics collected into a single score calibrated to reference conditions and used as a measure of biological condition.
Biological Integrity	The ability of an aquatic ecosystem to support and maintain a balanced, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitats within a region.
Biological monitoring or Biomonitoring	Use of a biological entity as a detector and its response as a measure to determine environmental conditions. Ambient biological surveys and toxicity tests are common biological monitoring methods.
Biological survey or Biosurvey	Collecting, processing, and analyzing a representative portion of the resident aquatic community to determine its structural and/or functional characteristics.
Bioregion	Any geographical region characterized by a distinctive flora and/or fauna.
Bog	A type of wetland that accumulates acidic peat, a deposit of dead plant material.
Chain-of-Custody	Process for ensuring that the “holder” of samples or other items is known at all times, and is documented in writing.
Classification	The grouping of entities based on similarity in common attributes.
Clean Water Act (CWA)	An act passed by the U.S. Congress to control water pollution (formally referred to as the Federal Water Pollution Control Act of 1972). Public Law 92-500, as amended. 33 U.S.C. 1251 et seq.
Clean Water Act 303(d)	This section of the Act requires states, territories, and authorized tribes to develop lists of impaired waters for which applicable water quality standards are not being met, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters. States, territories, and authorized tribes are to submit their list of waters on April 1 in every even-numbered year.
Clean Water Act 305(b)	Biennial reporting requires description of the quality of the Nation’s surface waters, evaluation of progress made in maintaining and restoring water quality, and description of the extent of remaining problems.
Clinometer	An instrument to measure elevation angles above horizontal.
Community	An association of interacting assemblages in a given waterbody, the biotic component of an ecosystem.

Cosmopolitan Species	Species with worldwide distribution or influence where there is suitable habitat.
Criteria	Limits on a particular pollutant or condition of a waterbody presumed to support or protect the designated use or uses of a waterbody. Criteria may be narrative or numeric.
Data entry and storage	The processes and structures for entering and archiving environmental data into a data management system.
Data quality	The magnitude of error associated with a particular dataset.
Data Quality Objectives (DQOs)	Qualitative/quantitative statements that clarify objectives, define appropriate data, and specify tolerable levels of decision error for monitoring programs. They and are used to determine the quality and quantity of data needed.
DELT Anomalies	Percentage of Deformities, Erosions (e.g., on fins or barbels), Lesions and Tumors on fish assemblages.
Densiometer	An instrument used to measure vegetative canopy closure.
Design objectives	Qualitative and/or quantitative statements that clarify the purpose of a specific study design.
Designated Uses	Those uses specified in water quality standards for each waterbody or segment whether or not they are being attained. Designated Use Attainment: Degree to which a stream is meeting its water quality designated use goals.
Diagnostic capability	The capacity, in qualitative/quantitative terms, of a process or measure to identify the status or cause of a particular stream condition.
Diatoms	Unicellular forms of algae that grow a silica shell that is preserved in underwater sediments after they die.
Disturbance	Any temporary change in the environment that causes a long-term change I ecosystem, community, or population structure.
Ecological attributes	Inherent qualities or characteristics of biological communities and their physical and chemical environments.
Ecological integrity	The condition of an unimpaired ecosystem as measured by combined chemical, physical (including physical habitat), and biological attributes. Ecosystems have integrity when they have their native components (plants, animals and other organisms) and processes (such as growth and reproduction) intact.
Ecoregion	A relatively homogeneous ecological area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.
Ecosystem-level functions	Processes performed by ecosystems, including, among other things, primary and secondary production; respiration; nutrient cycling; decomposition.

Error	<p>Variability, deviation from the true value.</p> <p>Random – variance the magnitude and direction of which cannot be predicted; some random error can be reduced through spatial and temporal aspects of the overall sampling design.</p> <p>Systematic (or measurement) – variance resulting from application or misapplication of sampling and analysis methods; generally controllable through consistent application of QC methods.</p>
Existing Uses	Those uses actually attained in a waterbody on or after November 28, 1975, whether or not they are included in the water quality standards (November 28, 1975 is the date on which EPA promulgated its first water quality standards regulation). Because an existing use has been attained, it cannot be removed unless uses are added that require more stringent criteria.
Fluvial	Having to do with flowing water; see also lotic.
Function	Processes required for normal performance of a biological system (may be applied to any level of biological organization).
Glacial	Having to do with glaciers; glaciers are large, long-lasting rivers of ice formed on land.
Heterotrophic	Obtaining organic matter from other organisms rather than synthesizing it from inorganic substrates.
Hyporheic Zone	Area below the streambed where water percolates through spaces between the rocks and cobbles. Also known as the interface between surface water and groundwater.
Historic conditions (Reference)	See <i>Reference condition</i> .
Historical Data	Data sets from previous studies, which can range from handwritten field notes to published journal articles.
Historically documented taxa	Taxa known to have been supported in a waterbody or region prior to enactment of the Clean Water Act, according to historical records compiled by state or federal agencies or published scientific literature.
Human Disturbance	Human activity that alters the natural state and can occur at or across many spatial and temporal scales.
Index of Biological/Biotic Integrity	An integrative expression of site condition across multiple metrics. An index of biological integrity is often composed of at least seven metrics.
Indicators	An environmental attribute whose presence or magnitude is indicative of specific environmental conditions.
Invasive species	A species whose presence in the environment causes economic or environmental harm or harm to human health. Native species or non-native species may show invasive traits, although this is rare for native species and relatively common for non-native species.
Least disturbed conditons (Reference)	See <i>Reference condition</i> .
Lentic	Aquatic ecosystem where water is non-flowing (e.g., pond or lake).
Life-history requirements	Environmental conditions necessary for completing life cycles (including, among other things, reproduction, growth, maturation, migration, dispersal).

Linear response	A statistical relationship where one factor changes with another factor in a way that can be characterized with a straight line equation.
Lithophils	Organisms that thrive on rocks or stones.
Lithopelagophils	Organisms that spawn in open gravelly areas and have no guarding behavior.
Littoral	Zone near the edge of a body of water; depending on the context, it can be used to signify near-shore areas to several cm in depth.
Lotic	Flowing waters (e.g., as in streams, rivers); see also fluvial.
Maintenance of populations	Sustained population persistence; associated with locally successful reproduction and growth.
Measurement Quality Objectives (MQOs)	Statements that define the specific measurement goals needed to meet the Data Quality Objectives (DQOs); they are quantitative thresholds or qualitative statements of performance characteristics. In general, the MQOs do not specify the methods, but provide criteria for describing different aspects of data quality.
Metric	A calculated term or enumeration representing some aspect of biological assemblage, function, or other measurable aspect and is a characteristic of the biota that changes in some predictable way with increased human influence.
Minimally disturbed conditions (Reference)	See <i>Reference condition</i> .
Montane	Descriptor of a geographic area dominated by mountains
Multimetric Index	An index that combines indicators, or metrics, into a single index value. Each metric is tested and calibrated to a scale and transformed into a unitless score prior to being aggregated into a multimetric index. Both the index and metrics are useful in assessing and diagnosing ecological condition. See Index of Biotic Integrity.
Multiple linear regression	Attempts to model the relationship between two or more explanatory variables and a response variable by fitting a linear equation to observed data.
Multivariate Analysis	Statistical methods (e.g. ordination or discriminant analysis) for analyzing physical and biological community data using multiple variables.
Narrative Biocriteria	Written statements describing the structure and function of aquatic communities in a waterbody necessary to protect a designated aquatic life use.
Native	An original or indigenous inhabitant of a region; naturally present.
Non-detrimental effect	Does not displace native taxa.
Non-native or intentionally introduced species	With respect to a particular ecosystem, any species that is not found in that ecosystem. Species introduced or spread from one region of the U.S. to another outside their normal range are non-native or non-indigenous, as are species introduced from other continents.
Non-wadeable streams and rivers	River reaches where boats are always necessary to access sample points or its only occasionally necessary to pull boats through shallow areas.
Numeric Biocriteria	Specific quantitative measures of the structure and function of aquatic communities in a waterbody necessary to protect a designated aquatic life use.

Performance Based Measurement Systems (PBMS)	Set of processes wherein the data needs, mandates, or limitations of a program or project are specified, and serve as criteria for selecting appropriate methods to meet those needs in a cost-effective manner.
Performance characteristics	Quantitative and qualitative descriptors of data quality, such as precision, accuracy, bias, representativeness, or completeness. Can also include terms such as selectivity, interferences, or others; other terms may be unique to particular methods or indicators.
Performance evaluation	Assessment of the acceptability of a measurement system based on the quality of data it produces.
Periphyton	A broad organismal assemblage composed of attached algae, bacteria, their secretions, associated detritus, and various species of microinvertebrates.
Phytoplankton	Microscopic, unicellular algae that are not attached to surfaces but typically remain suspended in the water column in aquatic ecosystems.
Piscivore	Predatory fish that eats mainly other fish.
Polyphils	Organism with no specialized spawning requirements, behavior, or preferred habitat.
P/R	Ratio of photosynthesis to respiration in a system.
Precision	The nearness of 2 or more measures of the same property.
Presently Attained Uses	Those uses actually being attained in a waterbody at the present moment.
Probabilistic design	Study or sampling characteristic that has randomization as a key component.
Quality assurance (QA)	A management system to assure quality in products or measurement systems.
Quality control (QC)	Technical procedures to ensure a process or product meets predetermined data quality objectives.
Random (probability) sampling	Drawing a sample unit from a population such that every unit has an equal probability of selection.
Rapid Bioassessment Protocols	Cost-effective techniques used to survey and evaluate the aquatic community to detect aquatic life impairments and their relative severity.
Reach	A length of stream or river lying between breaks in channel slope, local side-slopes, valley floor width, riparian vegetation, and bank material (Frissell et al. 1986).
Reference condition	The condition that approximates natural, unimpacted conditions (biological, chemical, physical, etc.) for a waterbody. Reference condition (Biological Integrity) is best determined by collecting measurements at a number of sites in a similar waterbody class or region under undisturbed or minimally disturbed conditions (by human activity), if they exist. Since undisturbed or minimally disturbed conditions may be difficult or impossible to find, least disturbed conditions, combined with historical information, models or other methods may be used to approximate reference condition as long as the departure from natural or ideal is understood. Reference condition is used as a benchmark to determine how much other water bodies depart from this condition due to human disturbance. <i>Also see Historic conditions, Minimally disturbed conditions, Best attainable conditions, and Least disturbed conditions.</i>

	<p>Best Attainable Condition: a condition that is equivalent to the hypothetical ecological condition of least disturbed sites where the best possible management practices are in use. This condition can be determined using techniques such as historical reconstruction, best ecological judgment and modeling, restoration experiments, or inference from data distributions.</p> <p>Historic Condition: physical, chemical, and biological conditions existing only in the historical record, in databases, reports, and literature; contribute to development of reference expectations.</p> <p>Least Disturbed Condition: the best available existing conditions with regard to physical, chemical, and biological characteristics or attributes of a waterbody within a class or region. These waters have the least amount of human disturbance in comparison to others within the waterbody class, region or basin. Least disturbed conditions can be readily found, but may depart significantly from natural, undisturbed conditions or minimally disturbed conditions. Least disturbed condition may change significantly over time as human disturbances change.</p> <p>Minimally Disturbed Condition: the physical, chemical, and biological conditions of a waterbody with very limited, or minimal, human disturbance in comparison to others within the waterbody class or region. Minimally disturbed conditions can change over time in response to natural processes.</p>
Reference criteria	A set of quantitative or qualitative rules used to identify reference sites. Usually based on a set of landcover and physical /chemical measures.
Reference site	A site selected for comparison with sites being assessed. The type of sites selected and the type of comparative measures used will vary with the purpose of the comparisons. For the purposes of assessing the ecological condition of sites, a reference site is a specific locality on a waterbody that is undisturbed or minimally disturbed and is representative of the expected ecological integrity of other localities on the same waterbody or nearby waterbodies.
Refugia	Accessible microhabitats or regions within a stream reach or watershed where adequate conditions for organism survival are maintained during circumstances that threaten survival, e.g., drought, flood, temperature extremes, increased chemical stressors, habitat disturbance, etc.
Regional Reference Condition	A description of the chemical, physical, or biological condition based on an aggregation of data from reference sites that are representative of a waterbody type in an ecoregion, subecoregion, watershed, or political unit.
Representativeness	A qualitative performance characteristic stating how well a value depicts what it is intended to depict.
Restoration	The re-establishment of pre-disturbance aquatic functions and related physical, chemical, and biological characteristics.
Rheophils	Organisms that flourish in free-flowing water.
Riparian area	Terrestrial ecosystem along the banks of a stream or river representing a vegetational transition between upland communities and the river.
River Invertebrate Prediction and Classification System (RIVPACS)	A predictive method developed for use in the United Kingdom to assess water quality using a comparison of observed biological species distributions to those expected to occur based on a model derived from reference data.
Sample collection	The process of taking a representative environmental measure.

Sample processing	The set of procedural steps a sample is taken through from collection to data entry.
Sampling Reach	A linear portion of a river selected for sampling purposes. A sampling reach may be of fixed (e.g., 1000 m) or variable length (e.g., 40 times the wetted width). See Section 3.1.1 for discussion.
Segment	A portion of a river system flowing through a single bedrock type and bounded by tributary junctions of major waterfalls (Frissell et al. 1986).
Sensitive taxa	Intolerant to a given anthropogenic stress; first species affected by the specific stressor to which they are "sensitive" and the last to recover following restoration.
Sensitive or regionally endemic taxa	Taxa with restricted, geographically isolated distribution patterns (occurring only in a locale as opposed to a region), often due to unique life history requirements. May be long-lived, late maturing, low fecundity, of limited mobility, or require mutualist relation with other species. May be among listed E/T or special concern species. Predictability of occurrence often low, therefore, requires documented observation. Recorded occurrence may be highly dependent on sample methods, site selection and level of effort.
Sensitive - rare taxa	Naturally occur in low numbers relative to total population density but may make up large relative proportion of richness. May be ubiquitous in occurrence or may be restricted to certain micro-habitats, but because of low density, recorded occurrence is dependent on sample effort. Often stenothermic (having a narrow range of thermal tolerance) or cold-water obligates; commonly k-strategists (populations maintained at a fairly constant level; slower development; longer life-span). May have specialized food resource needs or feeding strategies. Generally intolerant to significant alteration of the physical or chemical environment; are often the first taxa observed to be lost from a community.
Sensitive - ubiquitous taxa	Ordinarily common and abundant in natural communities when conventional sample methods are used. Often having a broader range of thermal tolerance than Sensitive- Rare taxa. These are taxa that comprise a substantial portion of natural communities, and that often exhibit negative response (loss of population, richness) at mild pollution loads or habitat alteration.
Spatial and temporal ecosystem connectance	Access or linkage (in space/time) to materials, locations, and conditions required for maintenance of interacting populations of aquatic life; the opposite of fragmentation; necessary for metapopulation maintenance and natural flows of energy and nutrients across ecosystem boundaries.
Spatial coverage	The area over which something is observed, measured, analyzed, or reported.
Stressors	Any physical, chemical, hydrologic, or biological factors that adversely affect aquatic organisms.
Structure	Taxonomic and quantitative attributes of an assemblage or community, including species richness and relative abundance structurally & functionally redundant attributes of the system = characteristics, qualities, or processes that are represented or performed by more than one entity in a biological system.
Study Design	Overall set-up of the study that includes the site selection, methods, number of replicate samples, and intended analyses. Examples include: Regional assessments - those that assess the average condition of water resource quality across a broad region for status and trends monitoring.

	<p>Site-specific assessments - assessments where the focus is a particular site or small set of sites – usually for the purpose of assessing the effects of a specific impact (e.g., effluent) or the effectiveness of a given intervention (e.g., restoration).</p> <p>Gradient assessments – assessments focused on determining the strength and direction of biological response to specific stressors.</p>
Subcategorized Uses	States and Tribes may adopt subcategories of a use and set the appropriate criteria to reflect varying needs of such subcategories of uses, for instance, to differentiate between cold water and warm water fisheries.
Swamp	A wetland featuring a permanent inundation of large areas of land by shallow bodies of water.
Taxa	A grouping of organisms given a formal taxonomic name such as species, genus, family, etc.
Taxa of intermediate tolerance	Comprise a substantial portion of natural communities; may be r-strategists (early colonizers with rapid turn-over times; "boom/bust" population characteristics). May be eurythermal (having a broad thermal tolerance range). May have generalist or facultative feeding strategies enabling utilization of relatively more diversified food types. Readily collected with conventional sample methods. May increase in number in waters with moderately increased organic resources and reduced competition but are intolerant of excessive pollution loads or habitat alteration.
Temporal coverage	The time period over which something is observed, measured, analyzed, or reported.
Thalweg	A line drawn to joint the lowest points along the entire length of a streambed.
Tolerant taxa	Comprise a low proportion of natural communities. Taxa often are tolerant of a broader range of environmental conditions and are thus resistant to a variety of pollution or habitat induced stress. They may increase in number (sometimes greatly) in the absence of competition. Commonly r-strategists (early colonizers with rapid turn-over times; "boom/bust" population characteristics), able to capitalize when stress conditions occur. Last survivors.
Tolerance Value	A number indicating the relative capacity of an organism to survive and reproduce in the presence of stressors.
Total Maximum Daily Load	The sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources; calculation of the maximum amount of a pollutant a waterbody can receive and still meet water quality standards and an allocation of that amount to the pollutant's source.
Use Attainability Analysis	Structured scientific assessment of the physical, chemical, biological or economic factors affecting attainment of the uses of waterbodies.
Wadeable stream or river	A fluvial waterbody that can be waded and/or adequately sampled by wading.
Water Quality Standards	A law or regulation that consists of the designated use or uses of a waterbody, the narrative or numerical water quality criteria (including biocriteria) that are necessary to protect the use or uses of that particular waterbody, and an antidegradation policy.

**Water Resource Management
(Non-Regulatory)**

Decisions on management activities relevant to a water resource such as problem identification, need for and placement of best management practices, pollution abatement actions, and effectiveness of program activity.

Zooplankton

Planktonic animals that range in size from microscopic rotifers to macroscopic jellyfish.